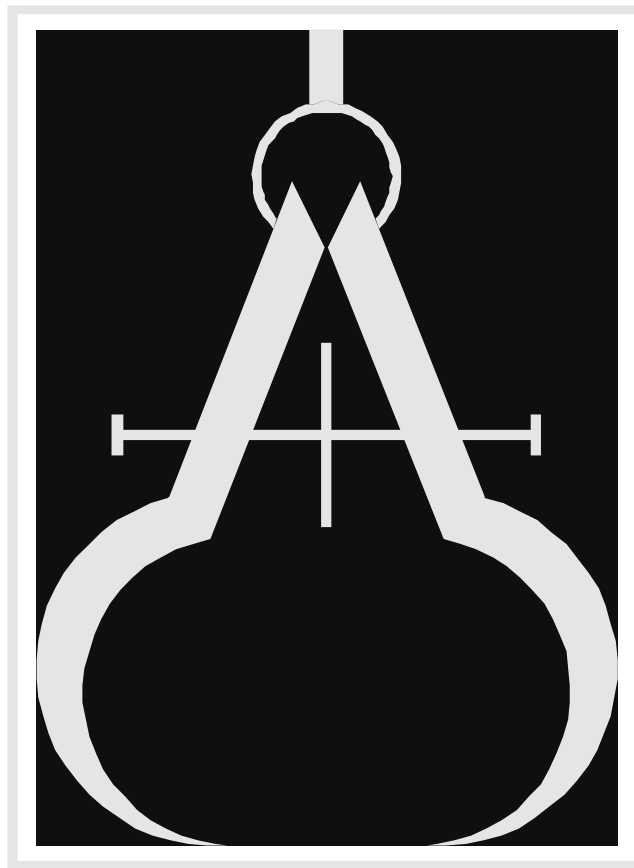


# Module 4

- Dust Measurements
- Opacity Pictures
- Plans



# How Do You Measure Dust?



# Dust Is Measured Through...

- Visible Emissions Readings that Measure Opacity
  - Opacity is a measure (quantitative assessment) of the dust emitted into the air

# How Do You Measure Opacity?

- USEPA Method 9
- If you see dust you can assume the visible emissions are above 10% opacity

# Method 9 Requirements

- Sun at your back
- Wind perpendicular to line of sight
- Contrasting background
- No co-mingling of plumes
- Six minute averages

# Opacity Pictures



# PLEASE NOTE

- The following pictures are for discussion purposes only.
- Do not use these pictures to make opacity measurements
- Viewing of these pictures does not meet the requirements for passing visible emissions certification

# Picture 1-Visible Emissions 0%

- Primary Crusher: Impactor
- Method 9 Wet (spray bar on crushing spread)
- Overall shot
- Haze in sky due to cumulus clouds





# Picture 2-10% Visible Emissions

- Primary crusher
- Method 9 Wet
- Look for
  - **10% Visible Emissions obscuring grizzly at left**



# Picture 3-20% Visible Emissions

- Primary with grizzly
- Method 9 Wet
- Loading Grizzly
  - **20% visible emissions just above hopper lid**
  - **Cumulus clouds to right**



# Picture 4-Visible Emissions 30%

- Primary with grizzly
- Backlit, wet
- Mixture of grizzly loading dust, primary dust, and haul road dust



# Picture 5-Visible Emissions 40%

- Primary
- Backlit, wet
- Backlit dust from primary



# Picture 6-Visible Emissions 0%

- Screen
- Method 9, wet
- Conveyor transfer points shrouded



# Picture 7-Visible Emissions 0%

- Screen
- Method 9, wet
- Detail of screen shows no Visible Emissions



# Picture 8-Visible Emissions 0%

- Conveyor
- Method 9, wet
- Shrouding



# Picture 9-Visible Emissions 40%

- Conveyor
- Method 9, wet
- Instantaneous





# Picture 10-Visible Emissions 0%

- Tertiary Crusher
- Method 9, wet
- Haze in sky



# Picture 11-Visible Emissions 5%

- Conveyor
- Method 9, wet



# Picture 12-Visible Emissions 5%

- Tertiary Crusher
- Method 9, wet
- Visible emissions can be noticed against sky



# Picture 13-Visible Emissions

## 40%

- Conveyor
- Backlit, wet
- Visible emissions obscure trees



# Picture 14-Visible Emissions

## 20%

- Tertiary Crusher
- Backlit, wet
- Apparent 20% Opacity obscuring trees



# Picture 15-Visible Emissions

## 30%

- Primary
- Backlit, wet



# Picture 21-Visible Emissions

## 15%

- Conveyor
- Method 9, dry
- 15% Opacity at shaded area in lower right center of photograph



# Picture 22-Visible Emissions

## 15%

- Tertiary Crusher
- Method 9, dry
- 15% Opacity at shaded area at bottom center of photograph





# Picture 23-Visible Emissions

## 15%

- Screen
- Method 9, dry
- 15% Opacity at transfer point to screen at top of photograph



# Picture 24-Visible Emissions

## 10%

- Screen
- Method 9, dry
- 10% Opacity at transfer point to screen at top of photograph

